BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 1 APRIL 1952 PART 8

INSTITUTE NEWS

Autumn Meeting, Oxford, Monday–Friday, 15–19 September 1952

The 1952 Autumn Meeting of the Institute will be held in Oxford from Monday to Friday, 15–19 September, inclusive. The Oxford Local Section Committee is acting as Reception Committee.

The following are Patrons of the meeting: The Lord Mayor of Oxford; the Vice-Chancellor of Oxford University; Viscount Nuffield, G.B.E., F.R.S.; Lord Cherwell, P.C., F.R.S.; Dr. T. E. Allibone, F.R.S.; Sir John Cockcroft, C.B.E., F.R.S.; Colonel Sir Ralph Glyn, M.C., D.L., M.P.; Mr. Kenneth Hall; Professor Sir Cyril Hinshelwood, F.R.S.; Major Albert Pam, O.B.E.; Professor F. E. Simon, C.B.E., F.R.S.; and Mr. R. Lewis Stubbs.

The meeting will open on the evening of Monday, 15 September, when Professor H. W. Swift, M.A., D.Sc., will deliver the Autumn Lecture, on the subject of the plastic deformation of metals.

An attractive programme is being planned, and—in addition to hotels—accommodation has been arranged (for men only) in Magdalen College, where a Common Room and bar will be provided for the convenience of members. The Council recommends this college accommodation to members and hopes that the rooms reserved will be fully booked. Members who expect to stay in college should—without obligation—advise the Secretary to that effect as early as possible.

Full particulars of the programme of the meeting will be published in the *Bulletin* as early as possible, and the usual printed programme and reply form will be circulated to members, probably in June.

Appeal to Industry for Regular Financial Support of the Work of the Institute

The Council will be grateful for subscriptions (particularly British subscriptions under covenant, on which the Institute—as a "charity"—may recover income tax) and donations from companies in the metallurgical and engineering industries which have not yet responded to the appeal for regular financial support of the Institute's work by industry. Copies of the printed letter of appeal will be gladly sent on request.

The following additional contributions have been received. Lists of previous donations are published in the *Journal*, 1952, (Feb.), pp. 346–347, and on pp. 39 and 51 of the February and March issues of the *Bulletin*, respectively.

A. Annual Donations Under Covenant for Not Less Than 7 Years.

	Net. £ s. d.	*Gross After Recovery of Tax by the Institute* £ s. d.
Simon-Carves, Ltd.	26 5 0	50 0 0
Barker and Allen, Ltd.	15 0 0	28 11 5

B. Donations to be Renewed Annually (Without Obligation), but Not Under Covenant.

	£ s. d.
Metal Supplies, Ltd.	5 5 0

C. Other Donations (Some of Which May be Renewed Annually).

	£ s. d.
B.S.A. Group of Companies	50 0 0
Maudslay Motor Co., Ltd., The	10 10 0
Platers and Stampers, Ltd.	10 10 0
Wright, Bindley and Gell, Ltd.	10 10 0
Miles (John) and Partners (London), Ltd.	5 5 0

Joint Library Committee

The Council has appointed the following to serve as representatives of the Institute on the Council of the Joint Library: Dr. J. C. CHASTON, Miss E. W. PARKER, Dr. L. B. PFEIL, O.B.E., and the Secretary.

Election of Members

The following 12 Ordinary Members and 12 Student Members were elected on 20 February:

As Ordinary Members

ANTEN, Jean H. P., Ing. Civil Chim., Chef du Service Recherches, Société Métallurgique de Prayon, Trooz, Belgium.

COPPENS, Jean J. W., Ingénieur Divisionnaire, Raffinerie Electrolytique, Société Générale Métallurgique de Hoboken, Olen, Belgium.

DRABBLE, Christopher, Chief Engineer, Rubery Owen (Warrington), Ltd., Warrington, Lancs.

GRIFFITHS, William D., L.I.M., Technical Assistant, Metals Division, Imperial Chemical Industries, Ltd., Elliott Works, Selly Oak, Birmingham.

HODGE, John Oliver, M.A., Representative, Swift, Levick, and Sons, Ltd., Clarence Steel Works, Sheffield 4.

MANLEY, S. J., Works Manager, Arkinstall Brothers, Ltd., Coventry Street, Birmingham 5.

MÜLLER, Horst, Dipl. Phys., Assistant, Institut für Metallforschung, Saarbruck 2a.
ROWLES, David Victor, B.A., Chief Engineer, Fielding and Platt, Ltd., Atlas Works, Gloucester.
SAMPLE, Ralph M., Marshall Laboratories, Inc., 311 Watson Avenue, Lyndhurst, N.J., U.S.A.
TAHIR, Samir, B.Sc., Ph.D., A.R.T.C., A.I.M., Lecturer, Faculty of Engineering, Ibrahim Pasha University, Abbasieh, Cairo, Egypt.
TARRING, Leslie Herbert, Joint Editor, *The Metal Bulletin*, 27 Albemarle Street, London, W.1.
WEIBULL, Ivar Richard Walfrid, Chief of Materials Laboratory, SAAB, Linköping, Sweden.

As Student Members

ALLISON, Dennis Fenwick, Student of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.
CANHAM, Royston Leonard, Laboratory Assistant, Dyson and Co., Ltd., Ponders End, Enfield, Middlesex.
CRONIN, Michael Eugene, Student of Metallurgy, University of Manchester.
DIXON, Herbert Neville, Student of Metallurgy, University of Manchester.
HIGGINS, Geoffrey Trevor, Student of Metallurgy, University of Manchester.
HOUGH, David John, Student of Metallurgy, University of Manchester.
LUMB, William, Student of Metallurgy, University of Sheffield.
MILLS, Donald, Student of Metallurgy, University of Manchester.
POCOCK, Geoffrey Kenneth, Student of Metallurgy, University of Manchester.
STUBBS, John, Student of Metallurgy, University of Manchester.
WALTON, Ronald K., Student of Metallurgy, University of Manchester.
WHITTAKER, Victor Nuttall, Student of Metallurgy, University of Manchester.

PERSONAL NOTES

MR. D. L. BIGGS has taken up a post as an assistant metallurgist in the Research and Development Department of The David Brown Foundries Company, Penistone.

MR. F. C. EVANS has been made a Director of Metallurgical Engineers, Ltd., Cannon Street, London, E.C.4.

MR. G. B. FOOTE has resigned his position as Works Manager of Southern Forge, Ltd., to take up an appointment as General Manager of the Australian Industrial Development Co., Ltd., Sydney.

DR. F. C. FRARY has retired from the post of Director of Research to the Aluminum Company of America, which he has held since 1918.

MR. R. LANCASTER has been appointed Works Manager of the Eyre Smelting Co., Ltd., Merton Abbey, London, S.W.19. He was previously Works Metallurgist.

MR. J. S. LLEWELYN LEACH has taken up a post on the research staff of Murex Welding Processes, Ltd., Waltham Cross.

MR. W. B. PEARSON has left the Inorganic Chemistry Laboratory, Oxford, where he has been working under Dr. Hume-Rothery, and returned to Canada.

MR. G. V. SYKES has been awarded a Second Class Honours degree in Metallurgy at London University, and is now on National Service.

MR. G. L. TURNER has recently been appointed Production Manager at the Bridge Foundry Co., Ltd., Wednesbury.

DR. K. R. VAN HORN has been appointed Director of Research to the Aluminum Company of America, in succession to Dr. Frary. He joined the Company in 1929 and was with its Cleveland Division until about 18 months ago, when he became Associate Director of Research at New Kensington, Pa.

MR. J. WARING has been appointed Lecturer in Metallurgy in the University of Queensland, Brisbane, Australia.

MR. D. WHITWHAM has left the Laboratoire du Centre National de la Recherche Scientifique, Vitry-sur-Seine, and is now a Metallurgist with the British Oxygen Co., Ltd.

MR. J. A. YOUNG has taken up an appointment in the Process Development Department of Rolls-Royce, Ltd., Derby.

Deaths

The Editor regrets to announce the death of:

HARRY BRYAN BARNARD, Birmingham Director of H. B. Barnard and Sons, Ltd., aged 26.

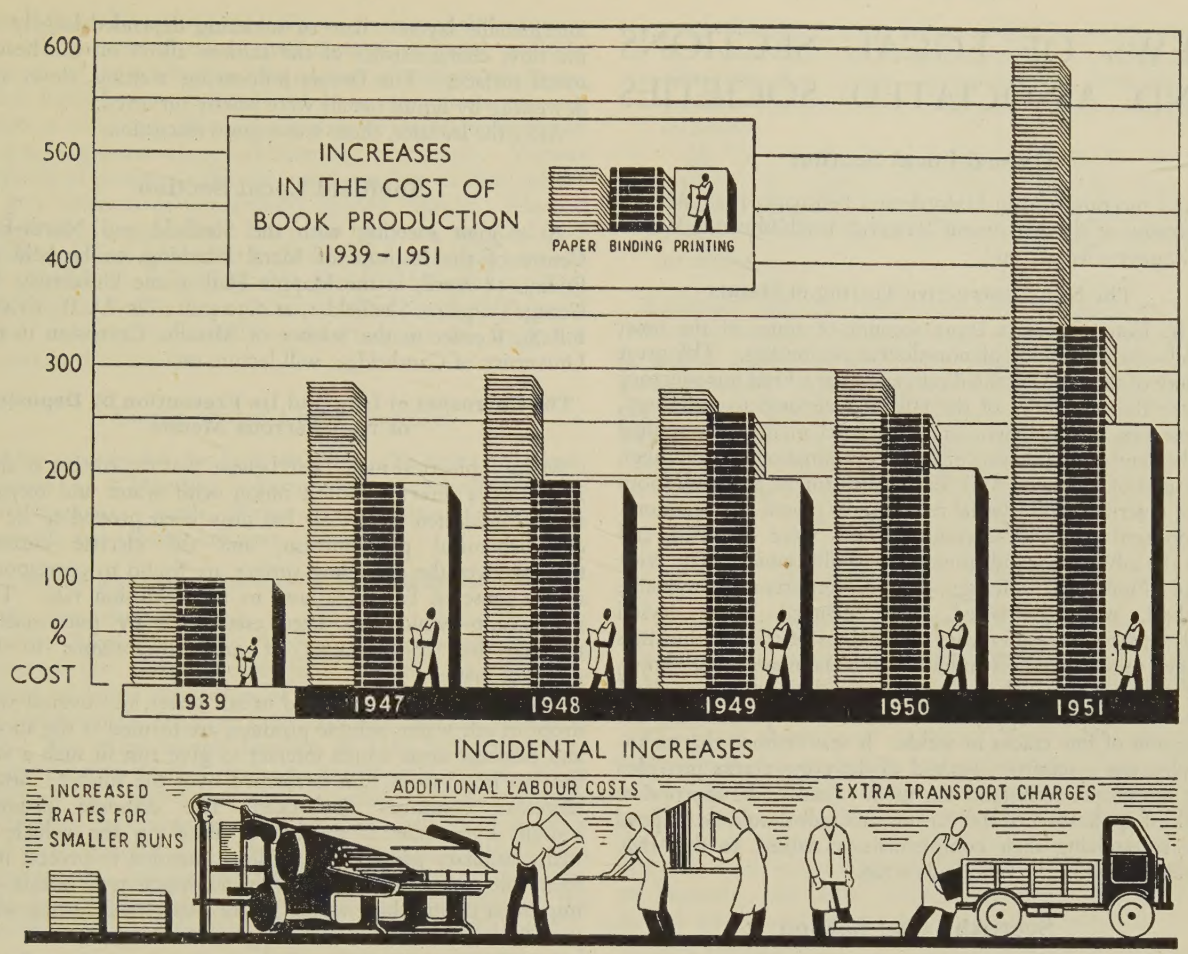
SIR JAMES LITHGOW, Bart., G.B.E., M.C., T.D., D.L., LL.D., J.P., Chairman of Lithgow's, Ltd., Port Glasgow, on 23 February 1952, aged 69.

OBITUARY

Mr. G. H. A. Field

Mr. Gordon Harvey Attwell Field, C.B.E., died on 3 February 1952, aged 66, after three years' ill health. Mr. Field was a native of Hartlepool, and had been connected with the aluminium industry for about 35 years. For the earlier part of this period, he was Head of the Technical Laboratory staff at Aluminium Corporation, Ltd., Dolgarrog. In 1930 he joined the Northern Aluminium Company, Ltd., and was appointed Research Manager in 1938. When Aluminium Laboratories Limited reopened their Banbury Laboratories in 1946, Mr. Field was appointed Director of Research, an appointment which he held until his retirement in 1950.

As one of his activities, Mr. Field served with distinction on many Governmental and other Committees. He was keenly interested in those aspects of technical control related to patent matters and with the formulation and application of specifications. During his period of office as Research Manager and Director, he gave strong support to the organization of research activities both within and outside the Companies with which he was associated and with Government departments. Mr. Field received the C.B.E. in 1949 for his contribution to research. He had been a member of the Institute of Metals since 1935.



This diagram is based upon average figures supplied by various trade organizations. The 1939 costs of paper, binding, and printing have each been taken as 100%; it should not be assumed, however, that they are of equal monetary value

Printing and Publishing Costs: Need for Economy in the "Journal"

Members may have noted that in the Reports of Council and of the Honorary Treasurer frequent reference has been made in the past few years to the increased costs of printing and paper, and their effects on the costs of publishing the *Journal*.

As it is probable that few members have visualized how great these increases have been since 1939, it is thought of interest to publish the accompanying diagram, which is based on average figures supplied by various trade organizations, and is reproduced by permission of the Publishers' Association.

In consequence of these continually increasing charges, it was necessary in July 1947 to raise the ordinary membership subscription from three guineas to four guineas a year and recently an appeal to industry for regular financial support had to be made by the Council to ensure that the Institute's work would not have to be curtailed.

The ready and generous response to the Council's appeal has enabled the Institute to maintain its services to science and industry and to plan substantial increases in its publication programme to overcome arrears of printing original research papers. The financial support now being received is promised, however, for a limited number of years. Members can now perform a real service to the Institute by helping very largely to increase the membership and so to spread the basic costs over a greater number of subscribers.

On the recommendation of a Sub-Committee that recently considered means by which economies in production of the *Journal* might be made in view of the greatly increased costs referred to above, it has been decided to insert all the plates illustrating the various papers in an issue at one point.

This measure will save paper, since in the past many plates have been blank on one side, and will reduce considerably the cost of binding the plates, without any serious loss to the reader.

The Publication Committee would once again urge on all authors the urgent need for papers to be written in the concisest possible way and for the number of illustrations (particularly photographs) to be kept to the absolute minimum.

Binding Cases

Binding cases for the *Journal*, 1949–50, vol. **76**, and 1950, vol. **77**, and for *Metallurgical Abstracts*, 1949–50, vol. **17**, are now available and may be obtained free of charge on application to the Secretary. Binding cases are still available for 1945 and subsequent years and may also be obtained on request.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

Oxford Local Section

At a meeting held in Oxford on 5 February, 1952, Mr. C. CROXSON, of the Armament Research Establishment, Woolwich, gave a lecture on:

The Non-Destructive Testing of Metals

The lecturer gave a short account of some of the most widely used methods of non-destructive testing. The great variety of these was pointed out, and after a brief introductory survey the remainder of the talk was devoted to radiology, ultrasonics, and magnetic and associated methods as applied to the detection of defects or to the examination of assemblies. The uses of magnets, A.C. flash transformers, and flash loops were described with special reference to practical precautions. Fluorescent and eddy-current methods were discussed, and also the advantages and limitations of ultrasonics. The wide scope of industrial radiology, the most important and valuable method, was emphasized. This included X-ray crystal analysis, stress measurement, applications of tracers, thickness gauges, uses of counters and ionization chambers, fluoroscopy, and radiography. The principles of radiography were outlined and typical applications mentioned, particularly the detection of fine cracks in welds. It was claimed that radiography was a sensitive method of detecting cracks provided that the proper technique was used. Finally, the appropriate fields of application of the various methods should be mapped out, recognizing their complementary nature, so that they could be used to the fullest advantage.

Scottish Local Section

The President (Professor A. J. MURPHY) and the Secretary (Lieut.-Colonel S. C. GUILLAN) paid an official visit to the Local Section on Monday, 11 February, 1952, when a meeting was held at 39 Elmbank Crescent, Glasgow, at 6.30 p.m. Mr. JOHN ARNOTT was in the Chair, and welcomed the President, who briefly addressed the Meeting.

Dr. J. C. CHASTON, Deputy Research Manager of Johnson, Matthey and Co., Ltd., then read a paper on:

Joining Metals

The lecturer gave a general survey of the principles underlying the joining of metals both by pressure welding and by the interposition of a liquid film, as in soldering and brazing operations. He said that in pressure welding, the essential requirement appeared to be simply that the two surfaces should be brought into intimate contact. Since, normally, two surfaces touch at a few spots only, considerable local plastic deformation and spreading was needed to produce the requisite degree of contact. Scratch-brushing appeared to be one of the best methods of producing a clean surface; aluminium and silver parts so treated could be cold welded at room temperature.

In soldering and brazing processes, the one fundamental condition for joining was again that the liquid solder should make intimate contact with the metal surfaces and the strength of a soldered joint was, in general, the strength of the alloy film. Joint strength might sometimes be increased by solution of the basis metal in the liquid solder; in other circumstances it might be reduced by the formation of brittle intermetallic layers. Ease of soldering depended largely on the flow characteristics of the molten alloys on the heated metal surfaces. The factors influencing wetting, flow, and dewetting by liquid metals were briefly surveyed.

After the lecturer, there was a good discussion.

Sheffield Local Section

At a joint meeting with the Sheffield and North-East Centre of the Institute of Metal Finishing, to be held on Friday, 18 April, in the Mappin Hall of the University, St. George's Square, Sheffield 1, at 6.30 p.m., Dr. U. R. EVANS, F.R.S., Reader in the Science of Metallic Corrosion in the University of Cambridge, will lecture on:

The Corrosion of Iron and Its Prevention by Deposits of Non-Ferrous Metals

Many " practical men " still believe that the rusting of iron is merely a direct chemical union with water and oxygen to give hydrated oxide. It has now been proved to be an electrochemical phenomenon, and the electric currents flowing over the corroding surface are found to correspond, in the sense of Faraday's law, to the corrosion rate. This relationship—which has been established by pure science research—has consequences of great importance to the practical man:

(1) When iron is immersed in salt water, or covered with drops of salt water, soluble products are formed at the anodic and cathodic areas which interact to give rust in such a way that no impervious film is formed over the surface; attack therefore continues unchecked. The cathodic product, sodium hydroxide, is capable of attacking the vehicle of many ordinary paints. Thus paints intended to protect iron from salt water should have vehicles which resist alkali—an important point which would not be expected if rusting were just a union with water and oxygen.

(2) If the composition of the water is so adjusted that a sparingly soluble substance would be produced either at the cathode or anode, its power to corrode iron is greatly reduced.

(3) The acid character of the moisture which condenses on iron exposed to the air in urban or industrial districts greatly increases the rate of attack, partly because the acid increases the proportion of soluble matter formed and partly because it aids the cathodic reaction.

(4) If iron is covered up with a discontinuous coating of another metal, being itself exposed at gaps in the coating, the exposed iron may sometimes escape attack. This may occur, for instance, if the coating is strongly anodic to the iron and the water one which deposits sparingly soluble bodies as cathodic products; but the immunity depends on suitable electrochemical conditions and must not be taken for granted.

(5) Conversely, if the coating is cathodic, the iron exposed at the gap will be attacked, and sometimes (but not invariably) the attack may be more intense than if the whole surface had been left bare.

The present shortage of the non-ferrous metals commonly used for protection of steel introduces the danger that manufactured articles may be presented for sale inadequately coated and soon start to rust in service, thus adversely affecting Britain's reputation for reliability and excellence of finish. A Productivity Council Team which recently visited America inserted in its report a wise warning against the hasty adoption of " kerbside " standards, but some of the daily papers which

quoted from this report have distorted or omitted the warning. The efficient use of the limited amount of metal available depends on the production of a coating of uniform thickness, unless liability to corrosion is likely to vary from point to point, in which case the thickness may be intentionally varied so as to be greatest where conditions are most severe. Various methods of coatings differ among themselves in their power to give uniform or intentionally graded deposits. Absence of porosity is important. For some purposes, the total bare area is more important than the number of pores, and methods are available for estimating that area. Liability to cracking in service is distinct from the porosity of the freshly coated metal, and great care must be taken to minimize dangerous stresses in the deposit.

South Wales Local Section

At a meeting of the Section held at University College, Swansea, on 5 February, a lecture was given by Mr. G. R. GOLDSWORTHY, South Wales Area Training Officer of Stewards and Lloyds, Ltd., on

Historical Developments of Tube Manufacture

with particular reference to the part played by the Landore Works, Swansea. The lecturer traced the development of the rotary piercer from the first machine invented by James Robertson of Glasgow in 1885, describing the Mannesmann machine, the Pilger mill, and the automatic mill. The Mannesmann Brothers in 1885 had rented part of the Siemens Steel Company's works at Landore, and it was there that they began the large-scale experimental work that led to the development of modern methods of seamless steel tube manufacture. The first long thin seamless tubes were dear in comparison with welded tube and so were cold-drawn tubes, but work continued, culminating in the modern type of rotary piercer installed at Landore in 1947.

JOINT ACTIVITIES

Mond Nickel Fellowships

The Mond Nickel Fellowships Committee now invites applications for the award of Mond Nickel Fellowships for the year 1952. Awards will be made to selected applicants of British nationality educated to University degree or similar standard, though not necessarily qualified in metallurgy, who wish to undergo a programme of training in industrial establishments: they will normally take the form of travelling Fellowships, though awards for training at Universities may be made in special circumstances. There are no age limits, though awards will seldom be given to persons over 35 years of age. Each Fellowship will occupy one full working year. The Committee hope to award up to five Fellowships each year of an average value of £750 each.

Mond Nickel Fellowships will be awarded in furtherance of the following objects:

(*a*) To allow selected persons to pursue such training as will make them better capable of applying the results of research to the problems and processes of the British metallurgical and metal-using industries.

(*b*) To increase the number of persons who, if they are subsequently employed in executive and administrative positions in the British metallurgical and metal-using industries, will be competent to appreciate the technological significance of research and its results.

(*c*) To assist persons with qualifications in metallurgy to obtain additional training helpful in enabling them ultimately to assume executive and administrative positions in British metallurgical and metal-using industries.

(*d*) To provide training facilities whereby persons qualified in Sciences other than Metallurgy may be attracted into the metallurgical field and may help to alleviate the shortage of qualified metallurgists available to industry.

Applicants will be required to state the programme of training in respect of which they are applying for an award, as well as particulars of their education, qualifications, and previous career. Full particulars and forms of application can be obtained from: The Secretary, Mond Nickel Fellowships Committee, 4 Grosvenor Gardens, London, S.W.1. Completed application forms will be required to reach the Secretary of the Committee not later than 1 June 1952.

OTHER NEWS

Magnesium Advisory Committee

The principal companies of the U.K. magnesium industry have formed a consultative and advisory body to be known as the Magnesium Advisory Committee (M.A.C.).

The broad objective of the M.A.C. will be to encourage expansion in the production and applications of magnesium and its alloys. Initial activities will be to hold regular discussions on general policy and technical matters as between the member companies, and to serve as the official liaison body for negotiations with the Ministry of Supply, Ministry of Materials, and other Government Departments on all related subjects, at present with particular reference to the Defence Programme.

Membership is open to all companies engaged in the production, casting, and/or hot working of magnesium or its alloys, with the provision of approval of applications by the Committee.

Founder Members of the M.A.C. are: Aeroplane and Motor Aluminium Castings, Ltd.; Birmetals, Ltd.; Birmingham Aluminium Casting (1903) Co., Ltd.; James Booth and Co., Ltd.; Bristol Aeroplane Co., Ltd.; High Duty Alloys, Ltd.; Kent Alloys, Ltd.; Magnal Products, Ltd.; Magnesium Castings and Products, Ltd.; Magnesium Elektron, Ltd.; Rolls-Royce, Ltd.; Sterling Metals, Ltd.; J. Stone and Co. (Charlton), Ltd.; Stone-Fry Magnesium, Ltd.

Meetings are for the present being held at Distillers House, St. James's Square, London, S.W.1, and Mr. R. G. Wilkinson, Deputy Chief Metallurgist, Magnesium Elektron, Ltd., Bath House, 82 Piccadilly, London, W.1, is acting as Honorary Secretary, to whom all communications should be addressed.

Second International Conference on Galvanizing

The success of the First International Conference on Galvanizing, held in Copenhagen in 1950, has led the Zinc Development Association to arrange another Conference to be held in Düsseldorf from 30 June to 4 July 1952. The scope of this Second Conference is being enlarged so that the subjects discussed may include not only general galvanizing but also that of sheet, wire, and tube.

Papers by experts from several countries have been promised on various subjects, including fluxing, acid disposal, causes

of pot failures, production of ductile coatings, and the galvanizing of wire. Further details of the Conference may be obtained from the Zinc Development Association, Lincoln House, Turl Street, Oxford.

Zinc-Rich Paints

The Corrosion Committee of the British Iron and Steel Research Association has issued the following statement about zinc-rich paints:

> "The use of the term 'zinc-rich paint' should be restricted to paints containing a sufficiently high percentage of zinc pigment to ensure direct electronic contact between the metallic particles in the dry paint film. There are theoretical reasons for believing that in the simplest case this will not occur unless the metallic zinc constitutes 92–95% by weight of the dried paint film, the exact value depending on the specific gravity and other properties of the vehicle."

The Corrosion Committee sponsored the work at the Cambridge University Metallurgical Laboratories which, during the early years of the last war, led Dr. U. R. Evans and Dr. J. E. O. Mayne to establish the usefulness of such paints in resisting corrosion, and the form in which they can be most effective. Zinc-rich paints are now finding numerous domestic and industrial applications.

DIARY

Local Sections

3 April. Birmingham. Annual General Meeting and Chairman's Address. (James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m.)

3 April. London. Annual General Meeting, followed by a discussion on "Grain Refining", to be opened by W. A. Baker. (4 Grosvenor Gardens, London, S.W.1, at 7.0 p.m.)

8 April. Oxford. "The Protection of Steel by Metallic Coatings", by Dr. U. R. Evans. (Black Hall, St. Giles, Oxford, at 7.0 p.m.)

18 April. Sheffield. "Corrosion of Iron and Its Prevention by Deposits of Non-Ferrous Metals", by Dr. U. R. Evans. Joint Meeting with the Sheffield and North-East Centre of the Institute of Metal Finishing. (The University, St. George's Square, Sheffield 1, at 6.30 p.m.) [For Synopsis of this lecture, see p. 68.]

Other Societies

3 April. Leeds Metallurgical Society. "Metal Spectroscopy", by E. S. Dreblow. (Chemistry Department, The University, Leeds 2, at 7.0 p.m.)

7 and 8 April. Royal Institute of Chemistry, London and South-Eastern Counties Section. "Symposium on Electrolytic Processes in Chemical and Metallurgical Industries." Joint meeting with the Society of Chemical Industry, London Section. (University College, Gower Street, London, W.C.1, 5.0 p.m. on 7 April and 4.0 p.m. on 8 April.)

9 April. Institute of Petroleum. "Corrosion Problems in Engineering", by Dr. S. F. Dorey. (Manson House, 26 Portland Place, London, W.1, at 5.30 p.m.)

17 April. Institution of Mining and Metallurgy. "A Review of the Ventilation of Some Deep Mines (Witwatersrand Gold Fields)", by M. Barcza. (Geological Society, Burlington House, Piccadilly, London, W.1, at 5.0 p.m.)

18 April. Liverpool Metallurgical Society. Annual General Meeting, followed by presentation of Prize-Winning Student Papers. (Lecture Theatre, Electricity Service Centre, Whitechapel, Liverpool, at 7.0 p.m.)

23–26 April. Institute of Metal Finishing. Spring Conference. (Grand Hotel, Eastbourne.)

24 April. Institution of Electrical Engineers. The Forty-Third Kelvin Lecture: "Iron Atoms in the Service of the Electrical Engineer", by Sir Charles Goodeve. (The Institution, Savoy Place, London, W.C.2, at 5.30 p.m.)

30 April. Institute of British Foundrymen, London Branch. Annual General Meeting, followed by paper and illustrations on "Surface Finish and Facing Sands", by F. Roy Pell. (Waldorf Hotel, Aldwych, London, W.C.2, at 7.0 p.m.)

30 April. Liverpool Metallurgical Society. Visit to the works of The Lancashire Steel Corporation, Irlam.

1 May. Leeds Metallurgical Society. Annual General Meeting, followed by Junior Members' Papers. (Chemistry Department, The University, Leeds 2, at 7 p.m.)

APPOINTMENTS VACANT

ABSTRACTOR/LIBRARIAN required by information department of light-alloy manufacturers in the Home Counties. Duties consist of maintaining abstract files, producing abstract bulletin, and doing some literature searching. Scientific training and experience in abstracting essential, foreign languages, particularly German, an advantage. Salary about £450 per annum. Apply giving particulars of qualifications to Box 331, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ASSISTANT CHEMIST required for the analysis of copper- and nickel-base alloys, and stainless steel. Knowledge of spectrographic analysis an advantage. Salary according to age, qualifications, and experience. Applications to Personnel Department, Langley Alloys Ltd., Station Road, Langley, Bucks.

ASSISTANT TECHNICAL SECRETARY required in London by the Metallurgy Division of the British Iron and Steel Research Association to administer technical Committees dealing with Metal Physics and the development of techniques for application to the iron and steel industry. Facilities for personal research available. A University degree or equivalent qualification in Physics or Metallurgy and administrative ability essential. Research and industrial experience in the applications of physical methods an advantage. Salary £450–£750 per annum according to age, qualifications, and experience. Written applications only, quoting "Metallurgy Division" and giving full curriculum vitae, to the Personnel Officer, B.I.S.R.A. 11, Park Lane, London, W.1.

CHEMIST, recently graduated, wanted for work in connection with the control and development of works' processes, by manufacturers of aluminium sheet, extrusions, and paste (paint pigment). The chemist's work would be largely practical, but would include laboratory work in both organic and inorganic chemistry. Box No. 332, Institute of Metals, 4, Grosvenor Gardens, London, S.W.1.

ELECTRICAL MANUFACTURERS, N. London, require a Metallurgical Chemist to work under the direction of the Chief Chemist on the control of metallurgical processes in the factories of the Company and to undertake investigational work on new processes and the use of alternative materials. The metals used are mainly non-ferrous, and applications should have had experience in non-ferrous metallurgy. This position offers good prospects for a person interested in a wide field of metallurgical work. Write giving details of age, qualifications, experience to Box 330, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

MAGNESIUM ELEKTRON, LTD., have several vacancies in their Metallurgical Research Dept. as follows:

(*a*) TECHNICAL ASSISTANTS age 21–25. Previous metallurgical experience and possession of Higher National Certificate essential.

(*b*) LABORATORY ASSISTANTS age 16–18. Must have General Certificate and be suited to scientific work. Facilities given for further part-time study.

Those appointed will be eligible within the rules of the Contributory Staff Pensions Scheme and for participation in Staff Bonuses: amenities include Staff Dining Hall, and Works Recreation Club. All applications to be addressed to Manager, Employment Exchange, Boundary Road, Swinton, Lancs.

RESEARCH METALLURGIST required for investigations on non-ferrous nickel alloys by North-West firm. Degree or equivalent desirable, but not essential. Permanent position. State full particulars of experience, training, and salary required. Box 333, Institute of Metals, 4, Grosvenor Gardens, London, S.W.1.

APPOINTMENT WANTED

JUNIOR MEMBER, 26, Arts graduate Oxon., linguist, 2 years' experience with City metal and ore merchants seeks training and work in ore or metal industry at home or abroad. Box 334, Institute of Metals, 4, Grosvenor Gardens, London, S.W.1.

THE NON-DESTRUCTIVE TESTING OF METALS

By R. F. HANSTOCK, Ph.D., F.Inst.P.

(Institute of Metals Monograph and Report Series, No. 10)

Cloth, 170 pp., with 72 illustrations

Price 21s. or $3.50, post free

In this specially commissioned monograph, Dr. Hanstock, who is Chief Physicist to High-Duty Alloys, Ltd., has made a comprehensive survey of the various methods that are available for the non-destructive testing of metals, ranging from liquid-penetration methods of crack detection to the use of X-ray diffraction for the determination of grain-size and orientation and for the measurement of internal stresses. Special attention is devoted to damping-capacity measurements as a means of non-destructive testing, a field in which the author himself has worked extensively in recent years.

Throughout, emphasis is laid on the physical bases of the methods described, with specific examples of their application in many cases. The use of the book is facilitated by an Appendix in which are given in tabular form the properties that may be assessed by non-destructive means, the various methods applicable in each case, and brief comments on their suitability and limitations.

CONTENTS

Measurement of Thickness; Evaluation of Surface Finish; Detection of Cracks; Radiography; Ultrasonics; Dynamic Tests; Damping-Capacity Measurements; X-ray Diffraction, Electrical and Magnetic Methods; Methods of Analysis.

THE INSTITUTE OF METALS

4 GROSVENOR GARDENS . LONDON, S.W.1

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